

American foulbrood detection is going to the dogs



AFB Detector Dog Flynn working bee hives Photo
Rene Gloor – www.renegloorcanine.nz

THE ROLE OF DOGS in detecting American foulbrood and the need for funding for research to learn more about canine assistance for apiarists are among topics aired on a science-related section of the NZ Beekeepers+ website.

American foulbrood (AFB) is a disease of honey bee larvae and pupae caused by the bacterium *Paenibacillus* larvae. Until recently, the bacterium was known as *Bacillus* larvae, but scientists have now determined that the organism should be in its own unique genus (*Paenibacillus*). It is the most serious honey bee disease in New Zealand, the control of which is a major cost to beekeepers.

The Science & Research Focus group of Apiculture NZ (ApiNZ) began contributing to the beekeepers' online forum in recent months in response to the rise of science-related questions and topics from hobbyists and professionals – varroa resistance, noseemas, pesticide

issues and so on. Barry Foster (chairman of the group) and John Mackay (member) are posting on behalf of the nine-member group. Mr Mackay is technical director at dnature diagnostics & research Ltd in Gisborne.

Once their willingness to engage on science or research topics that can benefit beekeeping had been announced, a Canterbury hobby beekeeper got the ball rolling by bringing dogs into considerations. He and others in the American Foulbrood Detector Dog programme – he said – are using different technology to control and eradicate foulbrood.

“We have the dogs and we know they are an effective tool,” he wrote. “We have science-based testing with swabs and cultures which have the potential to determine positives and negatives.

“Let’s marry the two and bring in a regime which draws

on the strength of science and the practicality of our four-footed friends to create a positive outcome for many bee operations who are pulling their hair out.”

The writer was disappointed that ApiNZ was not so enthusiastically embracing the idea. Their objection – he contended – is that if everyone uses dogs, then no one will go through the slow and time-consuming process of visual checking.

His post obviously hit a nerve. Several successive posts to the forum supported the use of dogs:

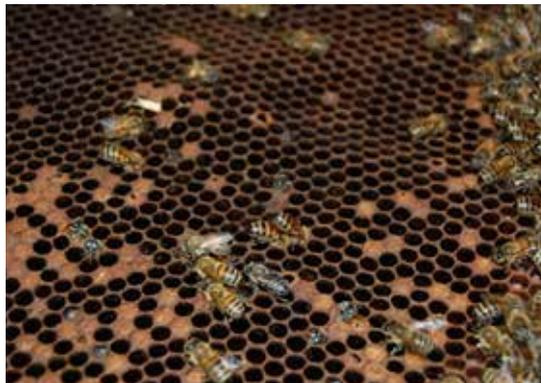
One forum member said he couldn't see the difference between the Customs Department's use of dogs as an indicator for forbidden foods or drugs and the use of dogs as an AFB indicator for closer human inspection.

What costly science study would be needed before there was an acceptance of the dogs' sniffing abilities? he asked.

Among the several other supporting remarks:

- AFB dogs are definitely a major part of the AFB solution.
- Dogs will really take off as more come on line.
- Anyone serious about eradication of AFB would consider a dog programme (and some science to back it up would be great).

The ApiNZ Science and Research team responded by noting there have been many requests for a trial of the use of dogs. Ways of doing this in combination with other new detection methods are being developed.



Several other science programmes already are being undertaken around AFB. These include:

- Massey University in Auckland is looking for viruses that infect bacteria such as AFB (*bacteriophages*). The researchers aim to characterise any candidates found and see whether a cocktail of them might provide control.
- DNA detection methods – rather than culturing for AFB (by growing it on a petri dish), newer methods have been developed or are being developed that use a real-time polymerase chain reaction, also known as quantitative polymerase chain reaction (qPCR) to detect AFB and estimate the level. Several groups are working in this area and it has been incorporated into the Ministry for Primary Industries' Bee Pathogen program.
- A Sustainable Farming Fund project in Otago/Southland is looking at a combination of methods in detecting and reducing/eliminating AFB from the region.

No one detection method is perfect, like varroa control, John Mackay said.

He noted that updates on several approaches can be expected in the science forums of the Apiculture NZ conference in Blenheim in late July.

He also mentioned the matter of money. Last year's apiculture conference was told the AFB levy is tapped out. A new levy to fund new developments has been proposed. Meanwhile the

ELIMINATION OF AFB IN NEW ZEALAND

The elimination of American foulbrood in “managed colonies” (that is, beehives) in New Zealand is the goal of the AFB NPMP (shorthand for the American Foulbrood National Pest Management Plan).

The management agency says the beekeeping industry is breaking new ground in setting this goal. The elimination of AFB has not been achieved on a national scale before, although there are examples of other animal diseases being eradicated from a country – the eradication of hydatids from New Zealand, for example.

The Government hopes to add *Mycoplasma bovis* to the list.

The elimination of AFB is considered possible in this country because the country has a relatively small population of honey bee colonies (estimated to be 550,000 including feral colonies) and because importations of additional colonies and other materials capable of carrying AFB, are controlled.

Some New Zealand beekeepers have fortified the management agency's confidence it can eliminate the disease by destroying colonies with AFB instead of using antibiotics and – by using management techniques to avoid the spread of the disease to other hives – effectively eliminating the disease from their own businesses.

Furthermore the incidence of the disease in New Zealand is relatively low.

science is being funded by others.

Mr Mackay spelled it out more clearly in a subsequent post: ApiNZ does not have the funds to do the trials required. Work is afoot to change this, but it is still some time away

Swiss-born Rene Gloor, who worked as the manager and trainer for the Government's Biosecurity Detector Dog Programme for several years, trains detector dogs from his base in Dunedin as well as in Taiwan, Korea, Canada, Australia, USA, Argentina.

He says the use of dogs for the detection of AFB has been proven to be very effective and can be a very useful tool in the fight against the spreading of the disease.

He offers to train dogs specifically for a client's apiary to be part of the inspection tools.

But he emphasises that the dogs are just an additional tool and do not replace the regular disease checks of the bee hives.

He advised readers of the beekeepers' online forum that his company is again trying arrange a trial with the AFB Management agency – but with not much luck so far. And he reiterated that the dogs are not perfect – they certainly have some deficiencies. But they do provide another tool that can be used like the dogs at the airports.

"It's the same at the airports," he wrote. "The x-ray machines and biosecurity officers are not perfect, either. Neither are the dogs. However together they complement each other and are a very effective detection tool." 🐾



LINKS

[Elimination of AFB](#)

[Ministry for Primary Industries' Bee Pathogen program](#)

[dnature diagnostics & research Ltd](#)

[NZ Beekeepers+](#)

[Apiculture NZ](#)

[Rene Gloor Canine](#)

A nudge to reopening the GM debate

Scientist Bob Brockie, in a column for Fairfax newspapers, in June said he looked forward to Sir Peter Gluckman debunking government and public attitudes towards genetic engineering as he had debunked the idea that traces of methamphetamine are a health hazard.

Dr Brockie referenced reviews by the British Royal Society, British Medical Association and American Academy of Science, Engineering and Medicine which concluded GE had never harmed anybody or anything.

To the contrary, the world's 28 million GE farmers have increased their crop yields by 22 per cent and their incomes by 66 per cent while reducing their use of pesticides by 37 per cent.

And more than 60 000 grateful New Zealand diabetics inject themselves with GE insulin every day without complaints.

Just before stepping down as the Prime Minister's

chief science advisor, Sir Peter chimed in and said it is time for New Zealand to restart the debate on genetic modification.

"The science is as settled as it will be," he said.

"That is, it's safe, that there are no significant ecological or health concerns associated with the use of advanced genetic technologies."

Areas where genetic modification could be used, Sir Peter suggested, included biosecurity, pest eradication and the need to change NZ's farming systems because of the environmental impact of the greenhouse gas emissions, the water quality issues, and so on.

Genetically modified High Metabolisable Energy ryegrass, developed by AgResearch with public and industry funding, meanwhile is being further researched in the mid-west of the United States. Unlike NZ, GM organisms can be field tested outside the lab there.